WHAT IS CLAIMED IS:

1. Bi-directional sliding pendulum seismic isolation systems for reducing seismic force acting on a structure by sliding pendulum movements, each system comprising:

a lower sliding plate forming a sliding path in a first direction;

an upper sliding plate forming a sliding path in a second direction; and

a sliding assembly for reducing the seismic force of the structure by performing a pendulum motion by sliding along the lower and upper sliding plates.

2. The systems as claimed in claim 1, wherein the lower and the upper sliding plates have sliding channels for sliding of the sliding assembly respectively, and the sliding assembly includes a main body, lower sliders sliding along the lower sliding channel, and upper sliders sliding along the upper sliding channel.

3. The systems as claimed in claim 1, wherein the lower and the upper sliding plates have sliding channels for sliding of the sliding assembly, and the sliding assembly includes an upper main body on which an upper slider is mounted on an upper surface thereof, a lower main body on which a lower slider is mounted on a lower surface thereof, and an elastic or elasto-plastic objects inserted between the lower and upper main bodies.

4. The systems as claimed in claim 1, wherein the lower and the upper sliding plates have sliding channels for sliding of the sliding assembly, and the sliding assembly includes an upper main body on which an upper slider is mounted on an upper surface thereof, a lower main body on which a lower slider is mounted on a lower surface thereof, and an

elastic or elasto-plastic objects inserted between the lower and upper main bodies, and wherein the sliding assembly is separable into upper and lower bodies rotating freely around a perpendicular axis.

5. The systems as claimed in claim 1, wherein the lower and the upper sliding plates have at least a pair of sliding channels for sliding of the sliding assembly,

wherein the sliding assembly has a ratio of a predetermined width/height not to be overturned when the sliding assembly performs the pendulum motion, and

wherein radius of curvature of an arc section of the upper sliding channel has a value smaller than radius of curvature of the first directional pendulum motion to prevent the upper slider from escaping from the upper sliding channel while the sliding assembly performs the pendulum motion in the lower sliding channel, and radius of curvature of an arc section of the lower sliding channel has a value smaller than radius of curvature of the second directional pendulum motion to prevent the lower slider from escaping from the lower sliding channel while the sliding assembly performs the pendulum motion in the upper sliding channel.

6. The systems as claimed in claim 3, wherein the elastic or elasto-plastic objects of the sliding assembly separable into upper and lower bodies are spheres having a predetermined elasticity and damping capacity, and the lower and the upper main bodies have hemispherical holes for mounting the spherical elastic or elasto-plastic objects respectively.

7. The systems as claimed in claim 4, wherein the elastic or elasto-plastic objects of

the upper and lower separable sliding assembly are spheres having a predetermined elasticity and damping capacity, and the lower and the upper main bodies have a hemispherical central hole for mounting the spherical elastic or elasto-plastic objects and a contour hole around the central hole respectively.

8. The systems as claimed in claim 4, wherein the lower and the upper main bodies have a hemispherical central hole and a contour hole around the central hole respectively, the spherical elastic damper having a predetermined elasticity and damping capacity is mounted in the central hole, and annular elastic or elasto-plastic objects having a predetermined elasticity and damping capacity are mounted in the contour hole.

9. The systems as claimed in claim 4, wherein the elastic or elasto-plastic object of the sliding assembly separable into upper and lower bodies is a disc type having a predetermined elasticity and damping capacity, and the lower and the upper main bodies have a hole for mounting the disc type elastic or elasto-plastic object respectively.

10. The systems as claimed in claim 1, wherein the sliding channels are formed in a plural number, and an escape prevention sill is provided between the sliding channels to prevent the sliders of the sliding assembly from escaping from the sliding channels.

11. Uni-directional sliding pendulum seismic isolation systems for reducing seismic force of a structure by earthquake motion of one direction, each system comprising:

a sliding plate having a sliding channel forming a sliding path in one direction; and

a sliding assembly for reducing the seismic force of the structure by performing

pendulum motion by sliding along the sliding channel.

12. The systems as claimed in claim 11, wherein the uni-directional sliding pendulum seismic isolation systems are installed in a multi-level structure to provide seismic isolation effects in all horizontal directions by performing pendulum motion in two directions horizontally.

13. A sliding assembly used in a bi-directional sliding pendulum seismic isolation system, the sliding assembly comprising:

a main body;

a lower slider provided at a lower portion of the main body, the lower slider sliding along a lower sliding channel of a lower sliding plate of the bi-directional sliding pendulum seismic isolation system; and

an upper slider provided at an upper portion of the main body, the upper slider sliding along an upper sliding channel of an upper sliding plate of the bi-directional sliding pendulum seismic isolation system.

14. The sliding assembly as claimed in claim 13, wherein the lower and upper sliders includes:

a slider support; and

a slider core mounted at an end of the slider support to freely rotate with respect to the slider support, the slider core being in frictional contact with the sliding channels in such a manner that the area contacted with the sliding channels is maintained even though the sliding assembly is located in a random position of the sliding channels.

15. The sliding assembly as claimed in claim 14, wherein the slider core has an upper surface of a shape corresponding to radius of curvature of the sliding channels and a lower surface of a semicircular plate type having a predetermined thickness and radius of curvature, and rotates with respect to the slider support when the lower surface is mounted in the slider support.

16. The sliding assembly as claimed in claim 14, wherein the slider core has an upper surface of a shape corresponding to radius of curvature of the sliding channels and a lower surface of a round shape having a predetermined radius of curvature, and rotates with respect to the slider support when the lower surface is mounted in the slider support.

17. The sliding assembly as claimed in claim 14, wherein the slider includes:

a slider support having a disc type supporting part of a predetermined thickness and radius of curvature of a convex form at an end; and

a slider core having an upper surface of a shape corresponding to the radius of curvature of the sliding channels and a concave part corresponding to the disc type supporting part, the slider core being mounted on the slider support in such a manner that the disc type supporting part is inserted into the concave part, and

wherein the slider core rotating with respect to the slider support.

18. The sliding assembly as claimed in claim 13, wherein the slider includes:

a slider support having a spherical supporting part of a predetermined radius of curvature, which is in the form of a convex at an end; and

a slider core having an upper surface of a shape corresponding to the radius of

curvature of the sliding channels and a concave part corresponding to the spherical supporting part, the slider core being mounted on the slider support in such a manner that the spherical supporting part is inserted into the concave part, the slider core freely rotating with respect to the slider support.

19. The sliding assembly as claimed in claim 13, wherein friction reducing materials are coated on the surface of the slider core to reduce a friction between the slider core and the sliding channel and a friction between the slider core and the slider support.

20. A sliding assembly used in a uni-directional sliding pendulum seismic isolation system, the sliding assembly comprising:

a main body; and

a slider formed at an upper portion of the main body, the slider sliding along the sliding channel of the sliding plate of the uni-directional sliding pendulum seismic isolation system,

wherein the slider includes a perpendicular slider support and a slider core mounted at an end of the slider support and being in frictional contact with the sliding channel, and

wherein the slider core is mounted to rotate with respect to the slider support and maintains an area contacted with the sliding channels even though the sliding assembly is located in a random position of the sliding channels.